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EXAMINER	
LAROSE, COLIN M	
ART UNIT	PAPER NUMBER
2624	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	09/895,429	WANG ET AL.	
	Examiner	Art Unit	
	Colin M. LaRose	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 December 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3 and 6-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,6,7,12 and 21-38* is/are rejected.

7)☒ Claim(s) *2,8-11,13 and 14* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Arguments and Amendments

1. Applicant's arguments and amendments dated 4 December 2006, have been entered and made of record.

Response to Amendments and Arguments

2. Applicant has amended claim 15 to denote that the computer readable medium having the data structure stored thereon is "for access by a program executing on a computer system." This change does not appear to overcome the previous § 101 rejection since the claim is still primarily directed to a data structure stored on a medium per se. The data structure does not impart functionality to a computer—it is merely data stored in a given format.

3. Applicant has amended claims 6, 21, and 34 to denote that curvature features of the stroke(s) are analyzed to determine whether the stroke(s) are "classified as unknown" – that is, the strokes are unrecognizable. This change is considered sufficient to overcome the previous § 102 rejection of claim 6 in view of Cass (6,304,674) and the § 103 rejections of claims 21 and 34 in view of Altman (5,517,578) and Cass (6,304,674). Accordingly, those rejections have been withdrawn.

However, new grounds of rejection in view of newly-discovered prior art appear below.

4. Applicant has amended claim 1 to denote that the curvature features comprise a "discreet curvature... defined using a difference between angels determined in accordance with points

along the stroke." Applicant asserts that Cass does not disclose such a limitation (see Remarks, p. 11). Examiner respectfully disagrees—see below for an explanation of how Cass is believed to disclose the claimed "discreet curvature."

5. Applicant's remarks with respect to claims 2 and 8 are persuasive (see Remarks, p. 12). Accordingly, the previous § 103 rejections of those claims have been withdrawn.

Claim Objections

6. Claim 29 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of previous claim 21. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim Rejections - 35 USC § 101

7. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

> Nonfunctional descriptive material that does not constitute a statutory process, machine, manufacture or composition of matter and should be rejected under 35 U.S.C. Sec. 101. Certain types of descriptive material, such as music, literature, art, photographs and mere arrangements or compilations of facts or data, without any functional interrelationship is not a process, machine, manufacture or composition of matter. USPTO personnel should be prudent in applying the foregoing guidance. Nonfunctional descriptive material may be claimed in combination with other functional descriptive multi-media material on a computer-readable medium to provide the necessary functional and structural interrelationship to satisfy the requirements of 35 U.S.C. Sec. 101. The presence of the claimed nonfunctional descriptive material is not necessarily determinative of nonstatutory subject matter. For example, a computer that recognizes a particular grouping of musical notes read from

> memory and upon recognizing that particular sequence, causes another defined series of notes to be played, defines a functional interrelationship among that data and the computing processes performed when utilizing that data, and as such is statutory because it implements a statutory process.

8. Claims 15-20 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claims 15-20 recite a "data structure" (stored on a computer-readable medium and intended to be accessed by a computer program), which does not impart functionality to a computer or computing device, and is thus considered nonfunctional descriptive material. Such nonfunctional descriptive material, in the absence of a functional interrelationship with a computer, does not constitute a statutory process, machine, manufacture or composition of matter and is thus non-statutory per se.

Rejections Under 35 U.S.C. § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 6, 7, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,084,985 by Dolfing et al. ("Dolfing") in view of U.S. Patent 5,757,962 by Gallo et al. ("Gallo").

Regarding claim 6, Dolfing discloses a computer readable medium having computer-executable instructions (i.e. a programmed data processing apparatus – column 2/53-56), comprising:

accessing information pertaining to at least one stroke (column 1/53-54: handwriting strokes are sensed in real-time);

extracting curvature features of the at least one stroke (column 1/56-57: features vectors from the handwriting stroke samples are derived – the feature vectors include curvature features of the stroke, such as the delta-angle feature, which indicates the incremental difference in writing angles – see column 8/1-16);

based upon an analysis of the curvature features, determining whether the stroke is text (column 1/58-64: the features vectors of the handwriting strokes are compared to predetermined model information in order to output a recognition value of the handwriting stroke, such as text as shown in figure 1); and

based upon an analysis of the curvature features, determining whether the stroke is classified as an unknown stroke (column 1/58-64: the features vectors of the handwriting strokes are compared to predetermined model information in order to output a recognition value of the handwriting stroke – if the stroke is not recognized, then it is "rejected" for being an unknown stroke).

Dolfing discloses that the handwriting strokes are input instantaneously and processed thereafter. Dolfing does not, however, expressly disclose that the strokes are accessed from a digital ink file, as claimed.

Gallo discloses a system for recognizing handwritten characters. In particular, Gallo teaches that when a handwritten stroke is sensed in real-time and digitized, it is also downloaded into a computer in a digital stroke file format (column 3/4-11). The file indicates the time-series of sensed coordinates that correspond to a handwritten stroke, as shown in figure 4. The file is

thereafter accessed and processed using known methods in order to recognize the stroke(s) contained therein.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Dolfing by Gallo to achieve the claimed invention by accessing the stroke information from a digital ink file, as claimed, since Gallo shows that it was both conventional and well-known to save handwritten stroke information in a digital file format and subsequently process the contents of the file in order to recognize the stroke(s) contained therein (column 3/4-11). The advantage of such a modification is that the digital stroke information can be saved in a file for later use and is not limited to immediate processing, as seemingly described in Dolfing.

Regarding claim 7, Dolfing discloses evaluating the stroke with a trainable classifier (i.e. a hidden Markov model).

Regarding claim 12, Dolfing discloses that the curvature features comprise the discreet curvature of the stroke (i.e. Dolfing's delta-angle features—corresponding to curvature—are represented by discreet values).

11. Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,304,674 by Cass et al. ("Cass").

Regarding claim 1, Cass discloses a computer readable medium (e.g. as shown in figure 1) having computer-executable instructions, comprising,

accessing a plurality of stroke samples representing a text class (figure 4, step 410: a first stroke pertaining to e.g. a text class is input for training and at step 430, subsequent strokes are input for training);

extracting curvature features of each of the strokes (column 3/61 through column 4/8: an inputted stroke is resampled and curvature features are extracted therefrom -- see figure 2);

using the curvature features, training a trainable classifier to classify the strokes (figure 4, steps 415-420: the stroke is classified using a HMM classifier), wherein the curvature features comprise a discreet curvature of the stroke, the discreet curvature being defined using a difference between angles determined in accordance with points along the stroke (figures 2 and column 4/3-8: the derivative of the tangent angle $\delta\theta_t$ represents the differences between tangent angles θ_t at discreet points along the stroke – i.e. $\delta\theta_t$ is equivalent to the incremental change in θ_t between two discreet points along the stroke).

Figure 4 of Cass shows the procedure for training the system to recognize strokes pertaining to a single class, such as a letter or a shape (i.e. text or drawing). Before training, Cass specifies a gesture class to which the subsequent stroke belongs (step 405). Cass does not expressly disclose running the training procedure for multiple gesture classes -- e.g. training for a "letter class" and then training for a "shape class." However, such a feature is so easily inferred as to be implicit in Cass's disclosure. Cass's system is operative to recognize different classes (and subclasses) of gestures, so it is readily apparent to those skilled in the art that the training must be performed for each of those classes.

Therefore, Cass fairly suggests accessing stroke samples corresponding to both text and drawing classes, extracting features from those strokes, and then training a classifier to classify the strokes of the two different classes using the curvature features, as claimed.

Regarding claim 3, Cass discloses the features include a tangent histogram of the stroke (i.e. a "series of second derivatives of the tangents of the curve" -- see column 4/2-8).

12. Claims 21-24, 26, and 29-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,084,985 by Dolfing et al. ("Dolfing") in view of U.S. Patent 5,757,962 by Gallo et al. ("Gallo") and U.S. Patent 5,517,578 by Altman et al. ("Altman").

Regarding claims 21 and 34, Dolfing discloses a computer readable medium having computer-executable instructions (i.e. a programmed data processing apparatus – column 2/53-56), comprising:

accessing information pertaining to a plurality of strokes (column 1/53-54: handwriting strokes are sensed in real-time);

determining a class for each of the plurality of strokes based upon an analysis of curvature features, wherein said determining includes determining whether each of the plurality of strokes is an unknown stroke (column 1/58-64: the features vectors – which include curvature features of the stroke, such as the delta-angle feature, see column 8/1-16 – of the handwriting strokes are compared to predetermined model information in order to output a recognition value indicative of the class of the handwriting stroke, such as text as shown in figure 1, or if the stroke is not recognized, then it is classified as being an unknown stroke and is "rejected").

Dolfing discloses that the handwriting strokes are input instantaneously and processed thereafter. Dolfing does not, however, expressly disclose that the strokes are accessed from a digital ink file, as claimed.

Gallo discloses a system for recognizing handwritten characters. In particular, Gallo teaches that when a handwritten stroke is sensed in real-time and digitized, it is also downloaded into a computer in a digital stroke file format (column 3/4-11). The file indicates the time-series of sensed coordinates that correspond to a handwritten stroke, as shown in figure 4. The file is thereafter accessed and processed using known methods in order to recognize the stroke(s) contained therein.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Dolfing by Gallo to access the stroke information from a digital ink file, as claimed, since Gallo shows that it was both conventional and well-known to save handwritten stroke information in a digital file format and subsequently process the contents of the file in order to recognize the stroke(s) contained therein (column 3/4-11). The advantage of such a modification is that the digital stroke information can be saved in a file for later use and is not limited to immediate processing, as seemingly described in Dolfing.

In addition, Dolfing does not appear to expressly disclose grouping some of the strokes based upon (local) characteristics, as claimed.

Altman discloses a system for recognizing handwritten characters. In particular, Altman teaches that handwritten strokes inputted into a recognition system are preferably grouped into characters (252, figure 5D) on the basis of local characteristics (column 8/21-44). The characters can then be utilized in a method that groups the characters into words (253-258, figure 5D).

Altman teaches that traditional methods do not separate ink strokes into words (column 1/45-51), but such a feature is desirable because it facilitates the execution of word-processing functions on graphical representations of recognized handwriting (column 1/58-61).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Dolfing and Gallo by Altman to achieve the claimed invention by grouping some of the strokes based on local characteristics thereof, as claimed, since Altman teaches that such a grouping feature helps provide full functionality of a word processing program that operates on recognized handwritten data, since inputted strokes can be grouped into meaningful data, such as characters and words.

Regarding claim 22, Altman discloses grouping some of the strokes based upon local characteristics of the grouped strokes comprises grouping some of the strokes based upon spatial information regarding the strokes (column 8/21-44: the local characteristics include spatial overlap).

Regarding claim 23, Altman discloses the distance between strokes is compared against a threshold distance (e.g. 40/64th of a line height) when forming "chained groups" (column 6, lines 53-57; column 7, lines 6-10; see also column 11, lines 29-41).

Regarding claims 24 and 26, Altman discloses grouping some of the strokes is based on a relative height threshold of the strokes (see e.g. column 6, lines 2-15).

Regarding claim 29, the combination of Dolfing, Gallo, and Altman teaches grouping some of he strokes based upon characteristics of the plurality of strokes, as explained above for claim 21.

Regarding claims 30 and 35, Altman discloses grouping the strokes based on the height of the strokes. The method determines whether this height is within some normalized height (e.g. two line heights). Such strokes are considered writing strokes (Altman column 5, lines 59-67 to column 6, lines 16). That is, the grouping of strokes is based upon a normalized height of at least some of the plurality of strokes. In addition, this grouping also involves weighting strokes "by multiplying the top coordinate of each stroke by 2, adding the bottom coordinate and then dividing the total by three [(2×top+bottom)/3]. All the strokes in the chained group are then associated with the line in which their average weighted vertical center lies" (Altman column 7, lines 17-30). That is, the height of the strokes is normalized during the chain grouping of Altman's method.

Regarding claims 31 and 36, Altman discloses:

(31.a.) Classifying some of the plurality of strokes as text strokes. See Altman, column 5, lines 41-61. Notice that method of Altman makes the distinction between drawing strokes and writing (text) strokes. See Altman, Fig. 2A, step 44 and Fig. 2B, step 54.

(31.b.) Grouping some of the strokes based upon characteristics of the plurality of strokes comprises grouping some of the strokes based upon a normalized height of the text strokes. This was addressed above for claim 30.

Regarding claims 32 and 37, Altman discloses grouping some of the strokes based upon a threshold distance between the strokes (column 8/32-44).

Regarding claims 33 and 38, Altman discloses:

(33.a.) Classifying some of the plurality of strokes as text strokes. See Altman, column 5, lines 41-61. Notice that method of Altman makes the distinction between drawing strokes and writing (text) strokes. See Altman, Fig. 2A, step 44 and Fig. 2B, step 54.

(33.b.) Designating at least one of the stroke groups as a text stroke group based upon at least some of strokes in the stroke group being text. This was addressed previously with respect to claim 29. For example, strokes in a region already determined to contain writing (text) strokes are assumed to be text strokes (Altman, column 5, lines 41-61).

13. Claims 25, 27, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,084,985 by Dolfing et al. ("Dolfing") in view of U.S. Patent 5,757,962 by Gallo et al. ("Gallo") and U.S. Patent 5,517,578 by Altman et al. ("Altman"), and further in view of U.S. Patent Application Publication 2002/0064308 by Altman et al. ("Altman '308").

The following is in regard to Claim 25. As shown above, Altman discusses a method of grouping and manipulating digital ink that conforms to the method of claim 24. Altman however, does not show grouping according to the local characteristics of the grouped strokes comprising grouping some of the strokes based upon a relative aspect ratio of the strokes.

Altman '308 essentially proposes an extension of the method proposed in Altman. In the method of Altman '308, the grouping of certain strokes is based on local characteristics that

include the relative aspect ratio of the strokes. See, Altman '308 column 18, lines 14-24 of paragraph [0130].

The teachings of Altman and Altman '308 are combinable, as they teach essentially the same underlying system and method of grouping and manipulating digital ink. Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the applicant's claimed invention, to use the relative aspect ratio to group certain strokes. According to Altman '308 (column 18, sentence 1 of paragraph [0129]), the motivation to do so would have been to account for certain strokes, such as those corresponding to dashes and/or bullets, during the grouping of strokes. Incorporating this aspect of Altman '308's method into the method of Altman, would yield a method that conforms to that which is put forth by the Applicant in claim 25.

The following is in regard to Claims 27-28. Taking into account the previous discussion relating to claim 25 and the discussions above relating to claims 26 and 21, respectively, it should be clear that combining the teachings of Altman '308 and Altman, in the manner just described, results in a method that conforms substantially to that of claims 27 and 28.

Allowable Subject Matter

14. Claims 2, 8-11, 13, and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Colin M. LaRose whose telephone number is (571) 272-7423. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta, can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000. Any inquiry of a general nature or relating to the status of this application or proceeding can also be directed to the TC 2600 Customer Service Office whose telephone number is (571) 272-2600.

Colin M. LaRose
Group Art Unit 2624
20 February 2007